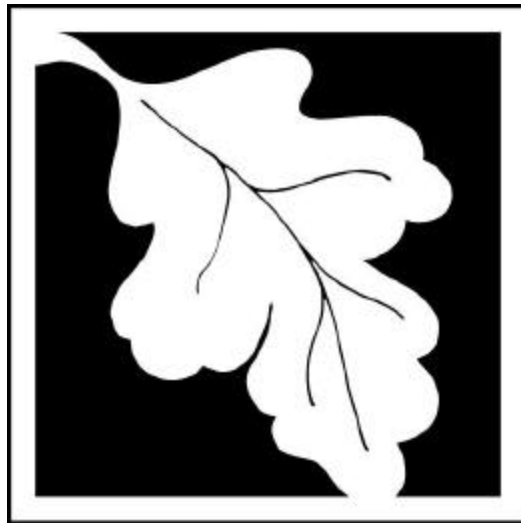


The Massachusetts Waste Site Cleanup Program

Measures of Program Performance

1993-2001



M a s s a c h u s e t t s
D e p a r t m e n t
of
E N V I R O N M E N T A L
P R O T E C T I O N

Prepared by:

Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup

ACKNOWLEDGEMENTS

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John F. Shea's "Hazardous Waste Cleanup Law," in Massachusetts Environmental Law (MCLE 1991 & Supp. 1993, 1996), was a valuable resource in preparing the summary of the early history of the waste site cleanup program found in Appendix A.

This document is available in Adobe Acrobat PDF format from DEP's web site. The address is www.mass.gov/dep/bwsc/files/mos/mopp.pdf.

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INTRODUCTION

Dear Massachusetts Citizens,

Many of us are aware of locations in our communities that have been affected by environmental contamination. We often read in the newspaper about nearby contaminated sites, and about the efforts of government and local citizens to have them cleaned up. Some of us become involved in local oversight committees. A dedicated few become activists and spend countless hours working to protect their communities.

It is clear that most citizens view the cleanup of contaminated sites as a very important issue. In 1986, a ballot initiative demanding improvements to the state's contaminated site cleanup law was approved by nearly seventy-five percent of voters. Since then, DEP has continued to witness high levels of organized citizen involvement, and it is evident that environmental contamination remains a top concern for Massachusetts residents.

As the agency responsible for overseeing most environmental cleanups in Massachusetts, DEP is committed to keeping citizens informed of the progress being made in this area. The purpose of this report is to provide citizens with an update on the overall status of the waste site cleanup program, focusing on progress made since the last major revision of the program in 1993 (See Appendix A for a summary of the history of the program).

One of the challenges in managing a complex regulatory program is to identify measures of performance that accurately demonstrate the successes and shortfalls of the program. The measures presented in this report were developed by DEP in consultation with a workgroup of interested parties, including environmental activists, scientists and business leaders. We will continue to work with program stakeholders to refine and supplement these measures as needed, to ensure that the public has access to information that is clear, understandable, accurate and representative of the performance of the waste site cleanup program.

The future success of the waste site cleanup program depends not just on DEP's efforts, but also on continued public involvement. The waste site cleanup program has been shaped throughout its history by the participation of concerned citizens. This history has demonstrated that the best results are obtained when government and citizens work as partners. We hope that the information provided in this report will help you continue as active partners in our efforts to clean up contamination and protect the citizens of the Commonwealth.

Sincerely,

Lauren A. Liss
Commissioner

EXECUTIVE SUMMARY

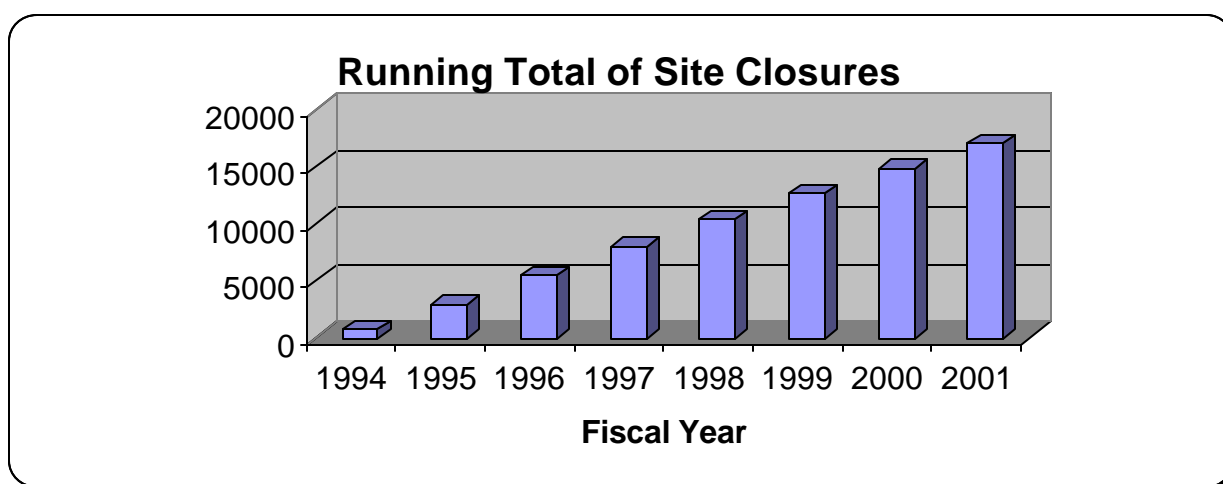
The purpose of this report is to provide citizens with an update on the overall status of the waste site cleanup program, focusing on progress made since the last major revision of the program in 1993 (see Appendix A for a summary of the history of the program). The measures presented in this report were developed by DEP in consultation with a workgroup of interested parties, including environmental activists, scientists and business leaders. The report provides a summary of the results of the waste site cleanup program (Part 1), and highlights some of the most successful, innovative, and important elements of the program (Part 2). The appendices provide background information and links to internet sites where program stakeholders can find more detailed information.

Basic Measures of Program Performance (Part 1)

Between 1983 and June 30, 2001, nearly 26,000 contaminated sites were reported to, or identified by, DEP. Most of these sites involved releases of oil to commercial or industrial properties, affecting soil and/or groundwater.

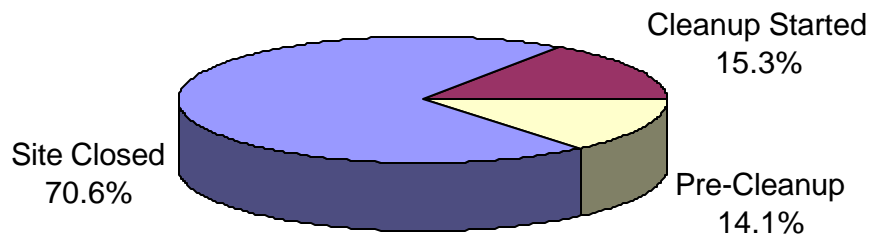
A small percentage of these 26,000 sites were cleaned up (if necessary) before the current cleanup regulations came into effect on October 1, 1993. However, most of the sites (approximately 24,000) required further action under the new cleanup program or were reported after the new program started.

Since October 1993, approximately 17,000 of these 24,000 sites (70%) have been closed, meaning that they have been permanently cleaned up, that no cleanup is necessary, or that temporary solutions have been reached that eliminate any substantial hazard to human health or the environment. An average of 2,300 sites per year have been closed, with sites requiring an average of 22 months to achieve closure.



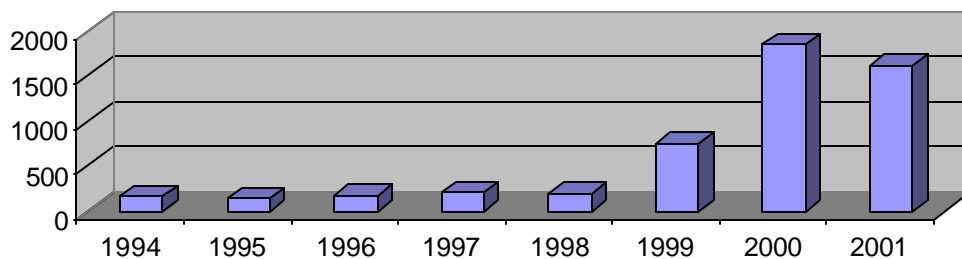
The remaining 30% of sites have not yet reached a permanent or temporary solution. However, as shown on the following graph, 85% of all sites have had at least some cleanup activity reported. Many more have begun the site investigation necessary to prepare for cleanup.

Cleanup Activities Conducted



The majority of work conducted in the waste site cleanup program is overseen by licensed engineers and scientists. These Licensed Site Professionals (LSPs) are responsible for ensuring that site cleanups meet regulatory standards. DEP audits a portion of the reports submitted by the LSPs to ensure that cleanups are done properly. Improvements to the audit program, and increased funding due to a dedicated appropriation in the 1998 Brownfields Act, have increased the number of audits conducted each year, from 165 in fiscal year 1994 to more than 1,600 in fiscal year 2001.

Number of Audits Per Fiscal Year



DEP works proactively to ensure that high priority sites are addressed. Examples include:

Responding to Emergencies: DEP is on call 24-hours to respond to emergencies, such as tanker truck rollovers, chemical fires, and more common situations such as leaking underground fuel storage tanks. DEP takes action at hundreds of these sites each year to protect the public and contain contamination before it spreads.

Protecting Water Supplies: DEP is continuously searching for waste sites that threaten to pollute public drinking water supplies. Through investigation, enforcement, and cleanup, DEP has addressed numerous threats to public water supplies since 1993.

Enforcement: DEP takes enforcement action to compel the parties responsible for sites to comply with deadlines set out in the cleanup regulations. DEP performs cleanup actions using public funds at the worst sites when necessary to ensure timely response. DEP then attempts to recover these costs whenever possible.

PART 1:

BASIC MEASURES OF PROGRAM PERFORMANCE

This section provides a summary of the results of the waste site cleanup program, including:

- A. Number of Releases Reported
- B. Types of Properties Affected
- C. Media and Structures Impacted
- D. Types of Contamination
- E. Time-Critical versus Non-Time-Critical Releases
- F. Locations of Sites (town, DEP region)
- G. Running Total of Site Closures
- H. Cleanup Activities Conducted
- I. Site Investigations
- J. Evaluation of Potential Risk

Except where otherwise noted in Appendix E, all data for this section are from October 1, 1993 through June 30, 2001.

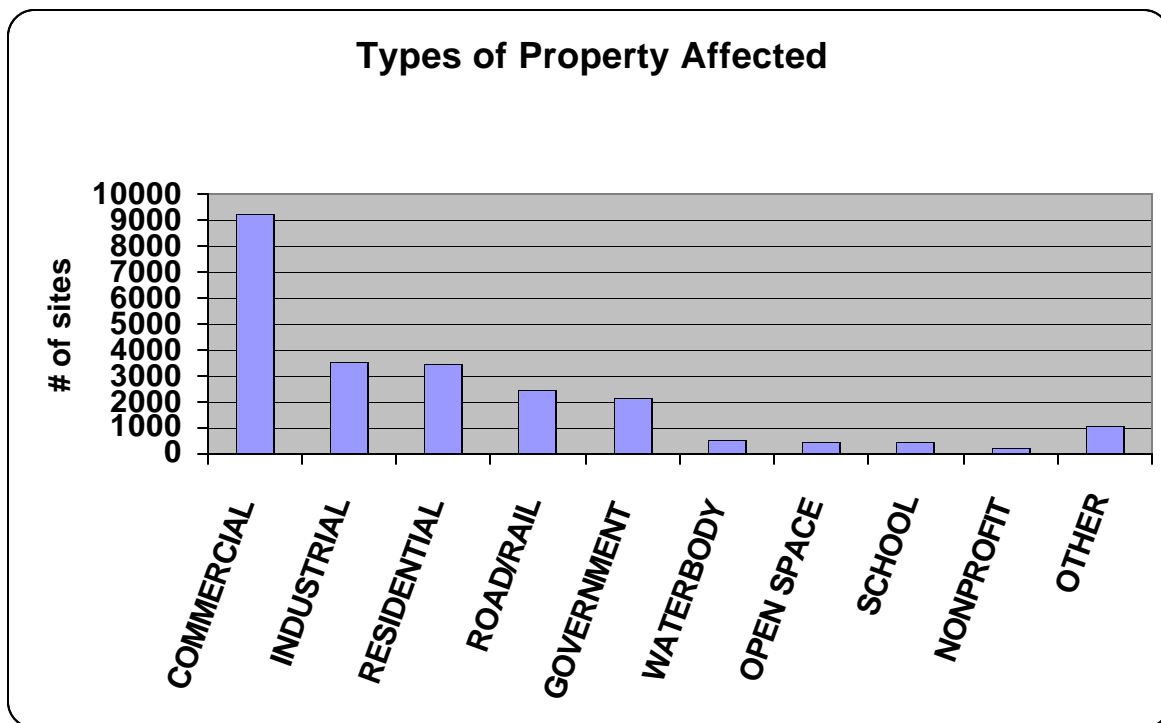
PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

A: Number of Releases Reported

- This report focuses on efforts to identify and clean up contaminated sites from October 1, 1993 (the day the current cleanup regulations took effect) through June 30, 2001 (the end of the 2001 fiscal year for Massachusetts).
- This report uses the words “release” and “site” to refer to contamination in the environment. Both words are defined in the state’s cleanup law, but can be generally summarized. A “release” is an incident that causes contamination (for example, leaking gasoline from an old underground storage tank). A “site” is a location at which a release has occurred (for example, the properties that are contaminated by the leaking gasoline).
- When the new regulations took effect on October 1, 1993, DEP knew of 6,367 contaminated sites in need of cleanup. These sites had been identified but not cleaned up under the previous set of regulations.
 - From 1983 to 1993, DEP had identified approximately 8,000 contaminated sites in Massachusetts.
 - In addition, more than 28,000 actual or potential “spills” of oil or hazardous material had been reported to DEP. However, in the majority of spill cases, it was determined soon after the spill was reported that it did not pose an environmental hazard warranting further action.
 - In preparing for the new cleanup rules to take effect in 1993, DEP and the new Licensed Site Professionals reviewed all of the previously reported sites and spills that were not yet closed, to determine which ones warranted further action under the new program. A total of 6,367 sites requiring action were identified. These sites transitioned into the new program for further investigation and/or cleanup.
- Since October 1993, 17,808 additional releases have been identified, bringing the total number of sites to 24,175. Most of these sites involve releases of oil to commercial or industrial properties, affecting soil and/or groundwater.
- This report describes the characteristics of these sites, and the progress that has been made to investigate and clean them up.

PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

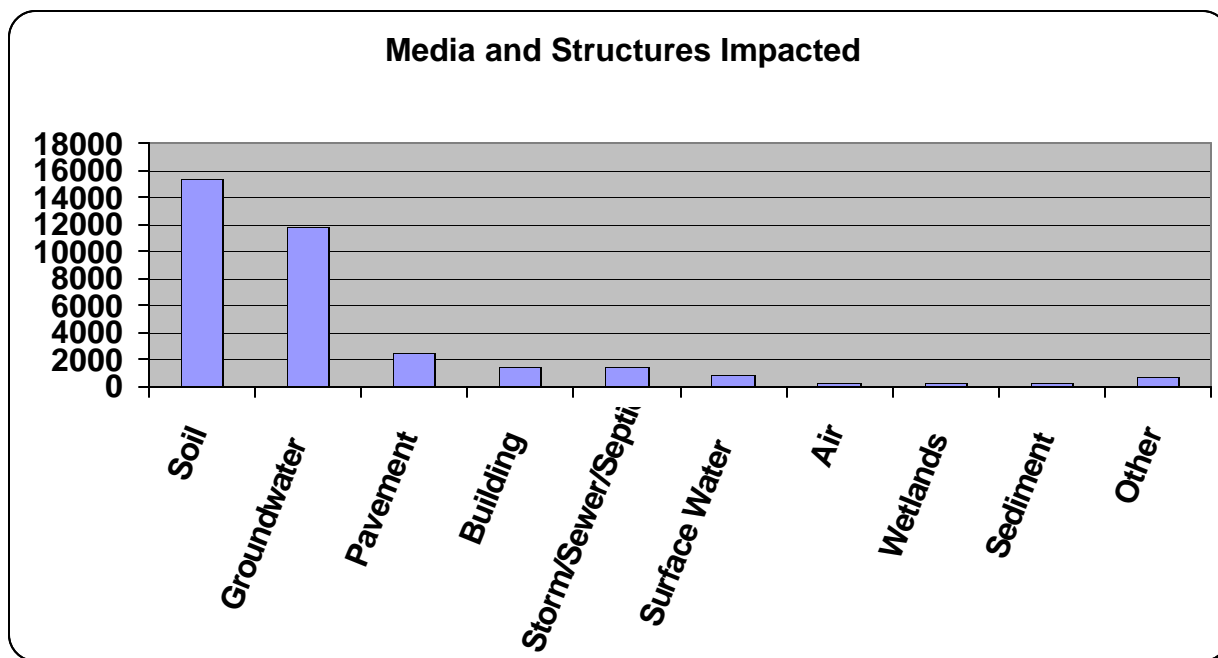
B: Types of Property Affected



- Commercial and industrial properties are the most common locations of waste sites, accounting for 61 percent of all sites.
- Examples of each category include:
 - Commercial: Gas stations, airports, dry cleaners, automobile dealers
 - Industrial: Utilities, manufacturing facilities, junkyards
 - Residential: Single- and multi-family homes, apartment buildings
 - Road/rail: Roads, railroads, parking lots, driveways, manholes
 - Government: Highway maintenance depots, military bases
 - Waterbody: Lakes, ponds, reservoirs, brooks, beaches
 - Open space: Farms, forests, parks, golf courses
 - School/Playground: K-12 facilities, day care, playgrounds
 - Non-profit: Churches, hospitals, colleges, cemeteries, museums
- A site may encompass multiple property types. For example, a large gasoline spill on a roadway in a mixed-use area might affect the road (Road/rail category), an adjacent convenience store (Commercial category), and a nearby apartment building (Residential category). The spill would be counted in each of the three categories.

PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

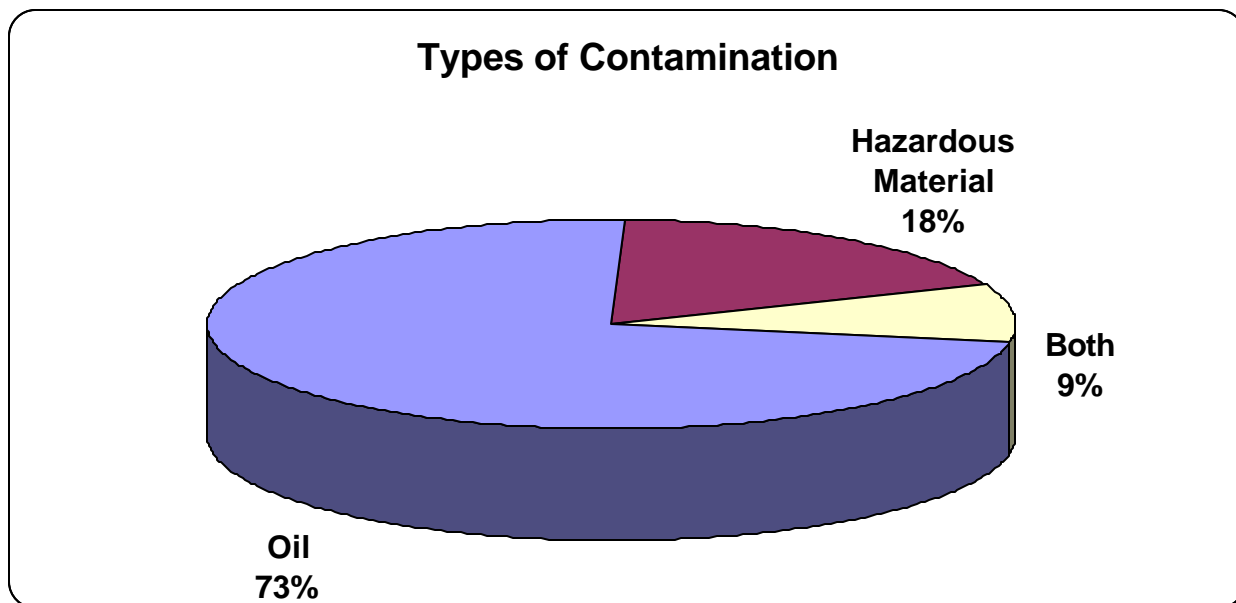
C: Media and Structures Impacted



- Impacts to soil are reported for nearly all releases (90%); impacts to groundwater are reported for more than two-thirds of all releases (69%).
- Impacts to surface water, indoor air, sediments, and other environmental media are reported far less frequently.
- Most groundwater impacts are not within drinking water source areas. Drinking water source areas are affected by approximately 22% of sites.
- Impacts to media other than soil or groundwater may be greater than shown. Data is derived from submittals received early in the site assessment process, before a thorough investigation of the release has taken place.
- DEP also tracks impacts to structures, such as pavement, buildings, storm drains, sanitary sewer systems, and septic tanks. These structures are often the pathways by which contamination enters the environment.

PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

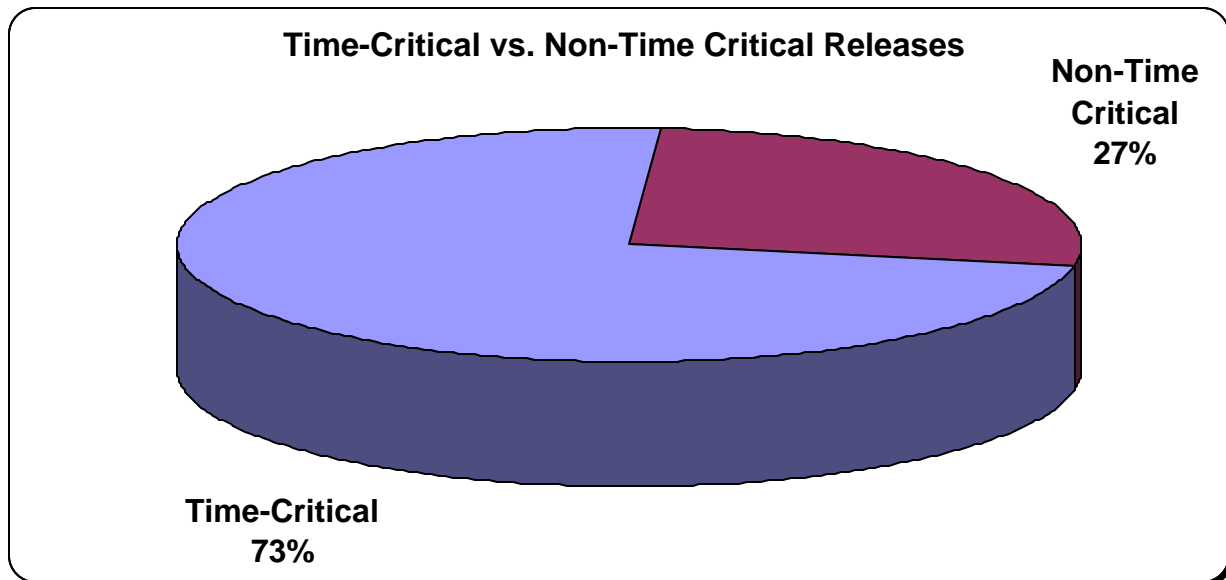
D: Types of Contamination



- Nearly three-quarters of releases involve oil only. “Oil” includes such things as home heating oil, gasoline, and diesel fuel.
- Approximately one quarter of sites involve hazardous materials. Hazardous materials range from those we frequently read about in the newspaper (PCBs, heavy metals such as lead and arsenic, dioxin, and asbestos) to items we often encounter in our daily lives (chlorine, household cleaners, and dry cleaning fluids).
- Hazardous materials are often more toxic than oil, more difficult to clean up, and persist longer in the environment.
- The Commonwealth’s cleanup law distinguishes between oil and hazardous materials, imposing liability on a broader range of parties involved with hazardous material sites. The most significant difference is that owners of property contaminated with hazardous material remain liable for the costs of cleanup even after selling the property (together with subsequent owners). Owners of property contaminated solely with oil may not remain responsible after selling the property.

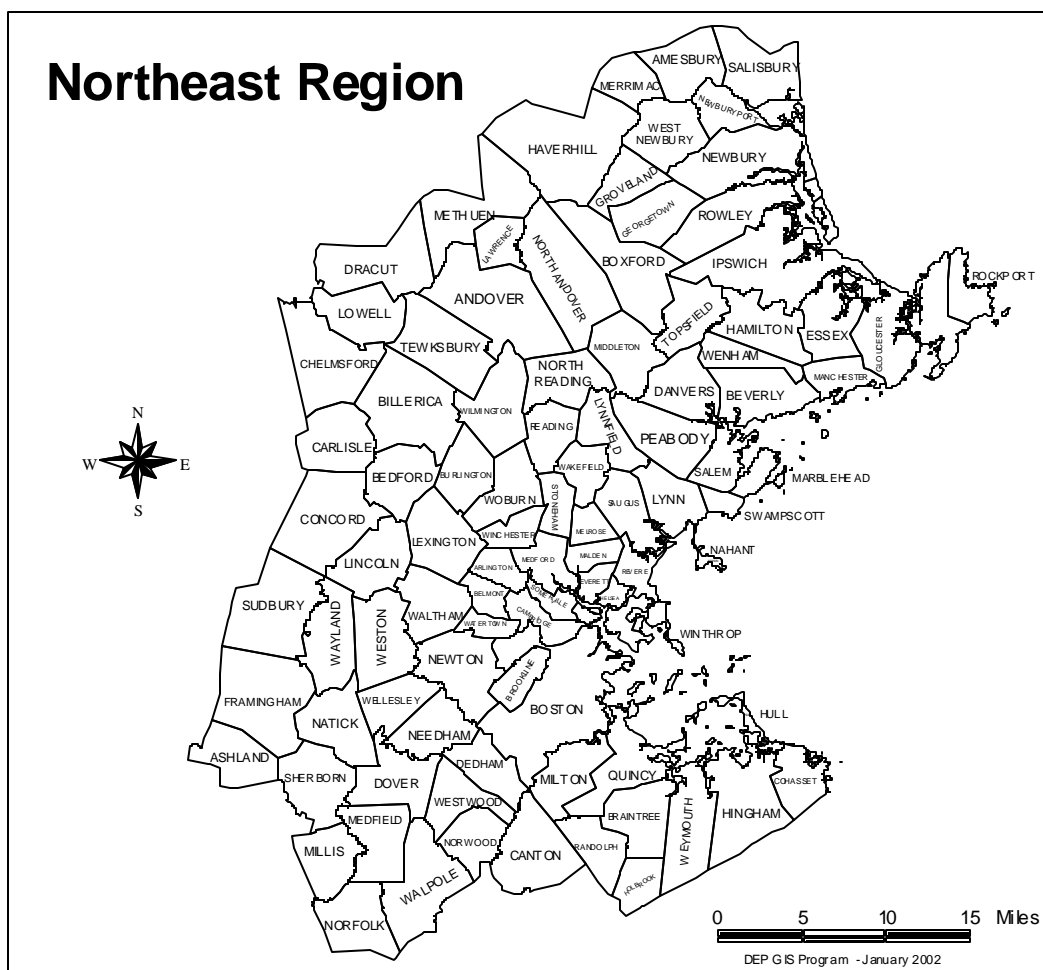
PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

E: Time-Critical vs. Non-Time Critical Releases



- 73% of all releases are time-critical releases that are reported to DEP soon after they occur. The remainder are non-time critical releases, sometimes discovered years or decades after the releases occurred.
- Time critical releases include spills from vehicles, sudden leaks from fuel tanks, discoveries of contamination in close proximity to water supplies, and any condition that poses an imminent hazard to human health or the environment (such as chemical vapors in a home).
- Time-critical releases must be reported to DEP within 2 or 72 hours of their discovery, depending on the nature of the release. Non-time critical releases must be reported within 120 days.

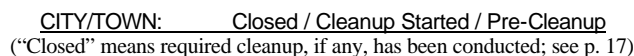
PART I: RELEASES REPORTED TO DATE
F: LOCATION AND STATUS OF WASTE SITES (AS OF JUNE 30, 2001)



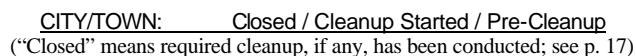
CITY/TOWN: _____ Closed / Cleanup Started / Pre-Cleanup
 ("Closed" means required cleanup, if any, has been conducted; see p. 17)

AMESBURY	40 / 3 / 19	ESSEX	11 / 3 / 2	MERRIMACK	7 / 0 / 1	SAUGUS	63 / 12 / 11
ANDOVER	88 / 15 / 15	EVERETT	122 / 31 / 40	METHUEN	93 / 20 / 18	SHERBORN	5 / 1 / 2
ARLINGTON	74 / 17 / 13	FRAMINGHAM	213 / 42 / 41	MIDDLETON	33 / 12 / 5	SOMERVILLE	188 / 38 / 31
ASHLAND	34 / 6 / 11	GEORGETOWN	16 / 3 / 4	MILLIS	20 / 5 / 3	STONEHAM	57 / 10 / 10
BEDFORD	59 / 22 / 10	GLOUCESTER	86 / 9 / 14	MILTON	47 / 8 / 3	SUDBURY	30 / 8 / 5
BELMONT	42 / 7 / 11	GROVELAND	16 / 1 / 4	NAHANT	3 / 2 / 0	SWAMPSCOTT	39 / 11 / 2
BEVERLY	96 / 15 / 15	HAMILTON	12 / 1 / 2	NATICK	234 / 29 / 29	TEWKSBURY	65 / 14 / 23
BILLERICA	84 / 22 / 18	HAVERHILL	125 / 22 / 29	NEEDHAM	91 / 8 / 20	TOPSFIELD	34 / 1 / 7
BOSTON	1822 / 444 / 363	HINGHAM	72 / 10 / 16	NEWBURY	10 / 4 / 3	WAKEFIELD	64 / 11 / 5
BOXFORD	14 / 0 / 0	HOLBROOK	24 / 7 / 4	NEWBURYPORT	51 / 8 / 10	WALPOLE	59 / 19 / 16
BRAINTREE	146 / 24 / 24	HULL	14 / 7 / 7	NEWTON	230 / 38 / 28	WALTHAM	233 / 40 / 34
BROOKLINE	128 / 20 / 13	IPSWICH	39 / 10 / 10	NORFOLK	11 / 6 / 6	WATERTOWN	91 / 28 / 24
BURLINGTON	74 / 23 / 36	LAWRENCE	123 / 37 / 35	N. ANDOVER	78 / 8 / 8	WAYLAND	30 / 6 / 9
CAMBRIDGE	333 / 63 / 80	LEXINGTON	73 / 21 / 15	N. READING	40 / 10 / 9	WELLESLEY	62 / 5 / 10
CANTON	112 / 23 / 22	LINCOLN	28 / 8 / 4	NORWOOD	116 / 15 / 21	WENHAM	11 / 2 / 0
CARLISLE	11 / 2 / 0	LOWELL	171 / 35 / 56	PEABODY	159 / 28 / 40	W. NEWBURY	8 / 1 / 0
CHELMSFORD	71 / 10 / 22	LYNN	197 / 42 / 34	QUINCY	198 / 40 / 44	WESTON	29 / 4 / 5
CHELSEA	151 / 29 / 25	LYNNFIELD	17 / 4 / 1	RANDOLPH	66 / 6 / 9	WESTWOOD	35 / 8 / 9
COHASSET	51 / 2 / 7	MALDEN	99 / 33 / 36	READING	56 / 10 / 9	WEYMOUTH	136 / 26 / 26
CONCORD	67 / 9 / 7	MANCHESTER	12 / 2 / 1	REVERE	123 / 26 / 27	WILMINGTON	83 / 21 / 22
DANVERS	109 / 20 / 11	MARBLEHEAD	23 / 8 / 8	ROCKPORT	21 / 6 / 6	WINCHESTER	59 / 10 / 10
DEDHAM	93 / 17 / 9	MEDFIELD	22 / 6 / 4	ROWLEY	19 / 2 / 5	WINTHROP	34 / 4 / 2
DOVER	23 / 3 / 4	MEDFORD	109 / 29 / 33	SALEM	134 / 25 / 25	WOBURN	169 / 33 / 38
DRACUT	42 / 8 / 6	MELROSE	44 / 5 / 4	SALISBURY	35 / 8 / 6		

Information about specific sites is available at <http://www.state.ma.us/dep/bwsc/sites/report.htm>



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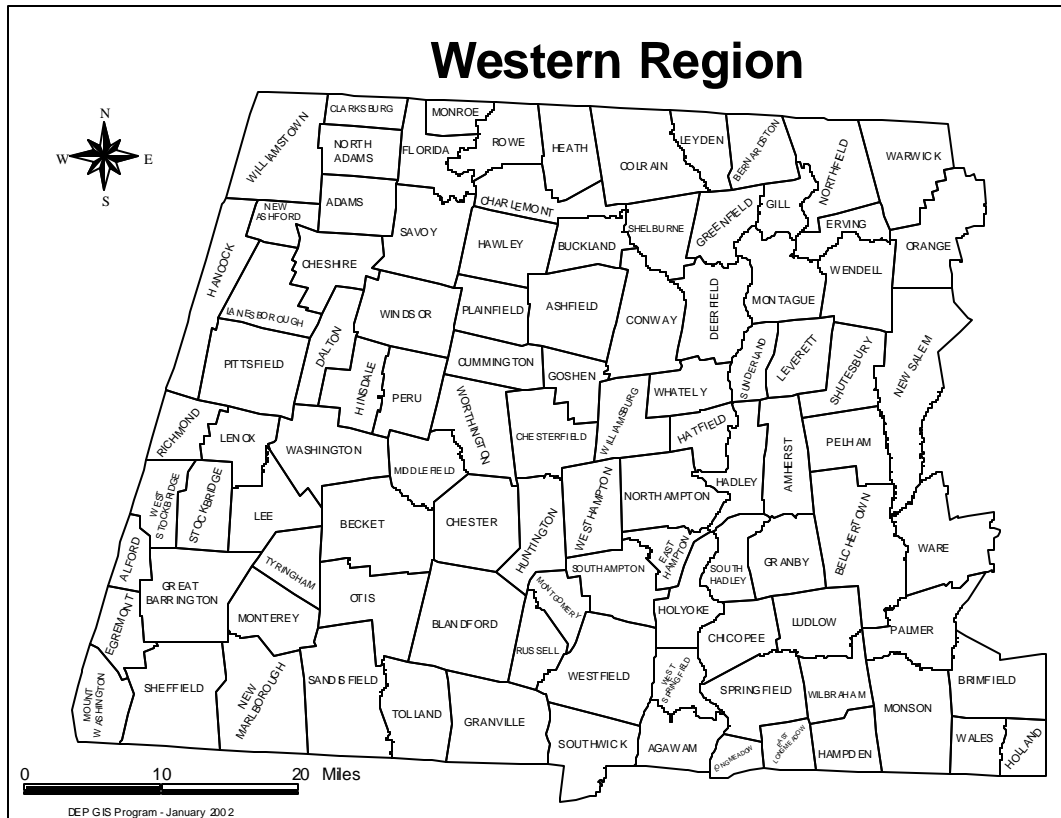


ACTON	45 / 14 / 11	FITCHBURG	146 / 26 / 18	MENDON	9 / 2 / 1	SOUTHBRIDGE	51 / 19 / 9
ASHBURNHAM	14 / 4 / 2	GARDNER	59 / 21 / 17	MILFORD	64 / 21 / 11	SPENCER	14 / 3 / 8
ASHBY	6 / 1 / 3	GRAFTON	36 / 10 / 3	MILLBURY	49 / 16 / 9	STERLING	13 / 3 / 0
ATHOL	32 / 10 / 8	GROTON	24 / 4 / 5	MILLVILLE	1 / 0 / 1	STOW	9 / 6 / 2
AUBURN	105 / 25 / 10	HARDWICK	8 / 3 / 0	NEW BRAintree	3 / 1 / 1	STURBRIDGE	49 / 10 / 1
				NORTH			
AYER	57 / 9 / 3	HARVARD	17 / 6 / 3	BROOKFIELD	13 / 2 / 3	SUTTON	20 / 13 / 0
BARRE	15 / 5 / 7	HOLDEN	28 / 11 / 6	NORTHBOROUGH	51 / 10 / 10	TEMPLETON	14 / 10 / 4
BELLINGHAM	33 / 8 / 7	HOLLISTON	19 / 3 / 6	NORTHBRIDGE	23 / 4 / 2	TOWNSEND	18 / 3 / 3
BERLIN	8 / 2 / 1	HOPEDALE	12 / 2 / 2	OAKHAM	2 / 2 / 0	TYNGSBOROUGH	17 / 6 / 5
BLACKSTONE	8 / 2 / 2	HOPKINTON	49 / 7 / 9	OXFORD	38 / 10 / 5	UPTON	10 / 1 / 0
BOLTON	20 / 3 / 0	HUBBARDSTON	9 / 2 / 3	PAXTON	5 / 2 / 1	UXBRIDGE	20 / 4 / 9
BOXBOROUGH	16 / 2 / 3	HUDSON	53 / 8 / 8	PEPPERELL	10 / 3 / 1	WARREN	20 / 0 / 4
BOYLSTON	11 / 2 / 2	LANCASTER	15 / 6 / 3	PETERSHAM	0 / 0 / 0	WEBSTER	35 / 12 / 6
BROOKFIELD	7 / 1 / 1	LEICESTER	22 / 6 / 4	PHILLIPSTON	3 / 0 / 0	WEST BOYLSTON	36 / 6 / 4
						WEST	
CHARLTON	51 / 15 / 9	LEOMINSTER	128 / 19 / 14	PRINCETON	7 / 5 / 0	BROOKFIELD	10 / 2 / 2
CLINTON	38 / 13 / 12	LITTLETON	37 / 5 / 2	ROYALSTON	0 / 0 / 0	WESTBOROUGH	68 / 20 / 8
DOUGLAS	7 / 3 / 1	LUNENBURG	21 / 3 / 4	RUTLAND	6 / 6 / 3	WESTFORD	29 / 5 / 6
DUDLEY	21 / 9 / 7	MARLBOROUGH	95 / 23 / 17	SHIRLEY	13 / 0 / 6	WESTMINSTER	24 / 6 / 4
DUNSTABLE	2 / 1 / 0	MAYNARD	19 / 3 / 3	SHREWSBURY	79 / 14 / 9	WINCHENDON	23 / 12 / 5
EAST							
BROOKFIELD	3 / 0 / 0	MEDWAY	9 / 4 / 7	SOUTHBOROUGH	50 / 2 / 5	WORCESTER	479 / 103 / 110

Information about specific sites is available at <http://www.state.ma.us/dep/bwsc/sites/report.htm>

PART I: RELEASES REPORTED TO DATE

F: LOCATION AND STATUS OF WASTE SITES (AS OF JUNE 30, 2001)



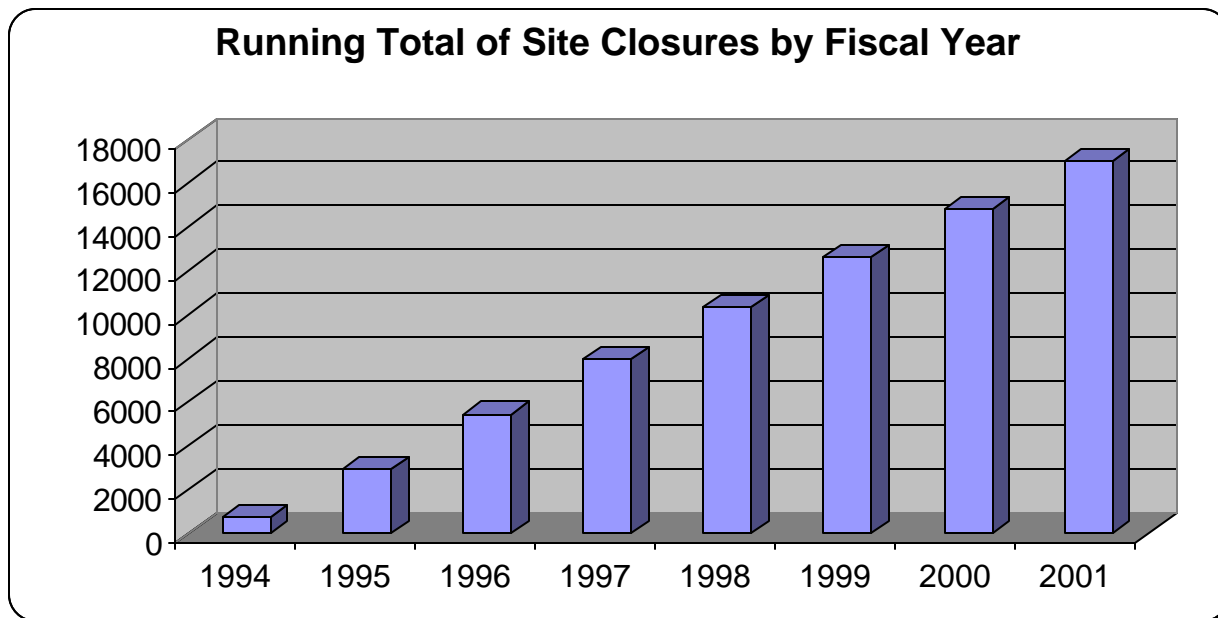
CITY/TOWN: Closed / Cleanup Started / Pre-Cleanup
 ("Closed" means required cleanup, if any, has been conducted; see p. 17)

ADAMS	25 / 8 / 4	FLORIDA	5 / 1 / 0	MONROE	0 / 0 / 0	SHELBURNE	2 / 1 / 1
AGAWAM	69 / 14 / 11	GILL	2 / 1 / 0	MONSON	25 / 6 / 4	SHUTESBURY	3 / 1 / 0
ALFORD	2 / 1 / 0	GOSHEN	2 / 0 / 0	MONTAGUE	16 / 3 / 2	SOUTH HADLEY	59 / 9 / 6
AMHERST	62 / 11 / 8	GRANBY	15 / 4 / 3	MONTEREY	3 / 2 / 1	SOUTHAMPTON	4 / 1 / 3
ASHFIELD	2 / 2 / 0	GRANVILLE	4 / 0 / 2	MONTGOMERY	2 / 0 / 0	SOUTHWICK	18 / 5 / 3
BECKET	6 / 4 / 0	GT BARRINGTON	50 / 7 / 5	MT WASHINGTON	0 / 0 / 0	SPRINGFIELD	364 / 78 / 78
BELCHERTOWN	38 / 4 / 4	GREENFIELD	66 / 23 / 6	NEW ASHFORD	1 / 0 / 0	STOCKBRIDGE	9 / 5 / 0
BERNARDSTON	8 / 3 / 3	HADLEY	15 / 8 / 1	NEW MARLBOROUGH	12 / 3 / 0	SUNDERLAND	1 / 5 / 1
BLANDFORD	10 / 1 / 2	HAMPDEN	8 / 1 / 2	NEW SALEM	3 / 0 / 1	TOLLAND	0 / 1 / 0
BRIMFIELD	6 / 4 / 1	HANCOCK	2 / 0 / 0	NORTH ADAMS	40 / 8 / 14	TYRINGHAM	1 / 0 / 1
BUCKLAND	18 / 1 / 1	HATFIELD	7 / 2 / 3	NORTHAMPTON	94 / 23 / 14	WALES	2 / 1 / 1
CHARLEMONT	4 / 0 / 1	HAWLEY	2 / 0 / 0	NORTHFIELD	10 / 3 / 1	WARE	22 / 3 / 3
CHESHIRE	5 / 4 / 0	HEATH	3 / 0 / 1	ORANGE	34 / 8 / 3	WARWICK	3 / 2 / 0
CHESTER	2 / 1 / 0	HINSDALE	9 / 1 / 1	OTIS	14 / 4 / 0	WASHINGTON	0 / 0 / 1
CHESTERFIELD	7 / 0 / 0	HOLLAND	6 / 0 / 0	PALMER	63 / 12 / 5	WENDELL	0 / 0 / 1
CHICOPEE	144 / 26 / 28	HOLYOKE	105 / 35 / 13	PELHAM	2 / 0 / 0	W SPRINGFIELD	130 / 24 / 13
CLARKSBURG	3 / 0 / 0	HUNTINGTON	3 / 2 / 1	PERU	0 / 1 / 0	W STOCKBRIDGE	15 / 1 / 0
COLRAIN	4 / 1 / 1	LANESBOROUGH	14 / 2 / 2	PITTSFIELD	216 / 39 / 86	WESTFIELD	108 / 26 / 25
CONWAY	4 / 0 / 0	LEE	50 / 8 / 12	PLAINFIELD	1 / 0 / 0	WESTHAMPTON	0 / 1 / 0
CUMMINGTON	3 / 2 / 1	LENOX	51 / 3 / 3	RICHMOND	4 / 1 / 0	WHATELY	12 / 0 / 0
DALTON	28 / 6 / 4	LEVERETT	1 / 1 / 0	ROWE	2 / 2 / 0	WILBRAHAM	31 / 8 / 8
DEERFIELD	15 / 3 / 2	LEYDEN	0 / 0 / 0	RUSSELL	12 / 0 / 1	WILLIAMSBURG	6 / 1 / 3
EAST							
LONGMEADOW	30 / 7 / 5	LONGMEADOW	46 / 12 / 2	SANDSFIELD	8 / 0 / 0	WILLIAMSTOWN	43 / 6 / 3
EASTHAMPTON	36 / 8 / 6	LUDLOW	42 / 13 / 6	SAVOY	0 / 1 / 0	WINDSOR	2 / 0 / 0
EGREMONT	13 / 1 / 0	MIDDLEFIELD	1 / 0 / 0	SHEFFIELD	10 / 6 / 2	WORTHINGTON	8 / 0 / 0
ERVING	10 / 1 / 1						

Information about specific sites is available at <http://www.state.ma.us/dep/bwsc/sites/report.htm>

PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

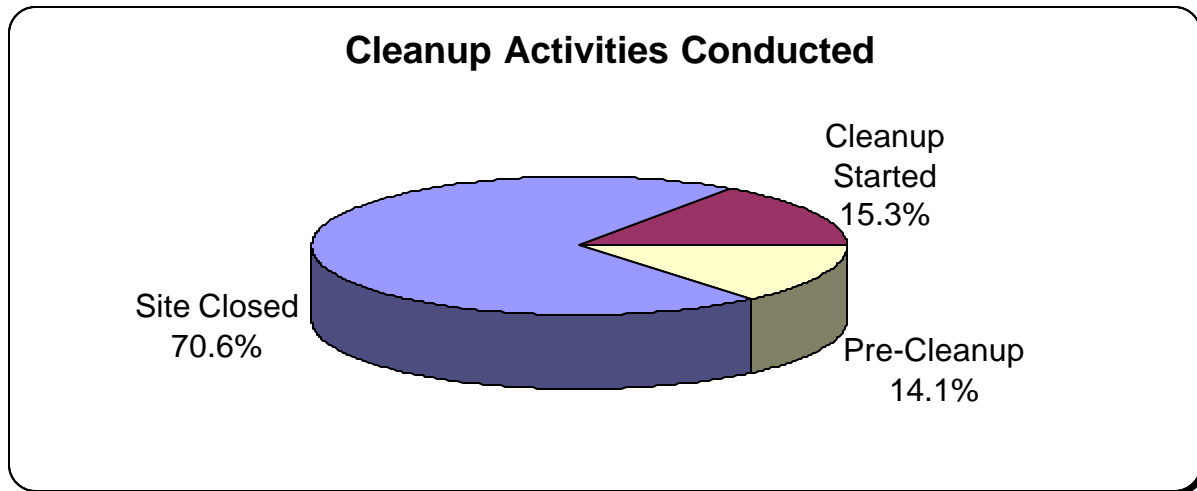
G: Running Total of Site Closures



- Nearly 17,000 waste sites have been closed since 1993.
- An average of 2,300 sites per year have been addressed, with sites requiring an average of 22 months to achieve closure.
- More than half of the releases reported since 10/1/1993 have been closed within a year of being reported to DEP.
- A site is deemed closed when it is demonstrated that the site is permanently cleaned up, that no cleanup is necessary, or that a temporary solution is in place to address any substantial hazards to human health, safety, welfare, or the environment. Sites with temporary solutions must be re-evaluated every five years to determine whether additional cleanup is necessary and feasible.
- The average number of closures per year is approximately 2,000.
- Nearly all site closures to date (97.6%) are permanent. 2.4% involve temporary solutions.
- In nearly all cases, the determination that a site is closed is made by a private consultant who is trained and licensed to make such determinations. These consultants, known as Licensed Site Professionals (LSPs), are responsible for ensuring that the cleanup standards set forth in DEP's regulations are complied with. Failure to do so can result in an LSP losing his or her license.
- DEP screens nearly all cleanup determinations to identify any potential problems in the documentation.

PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

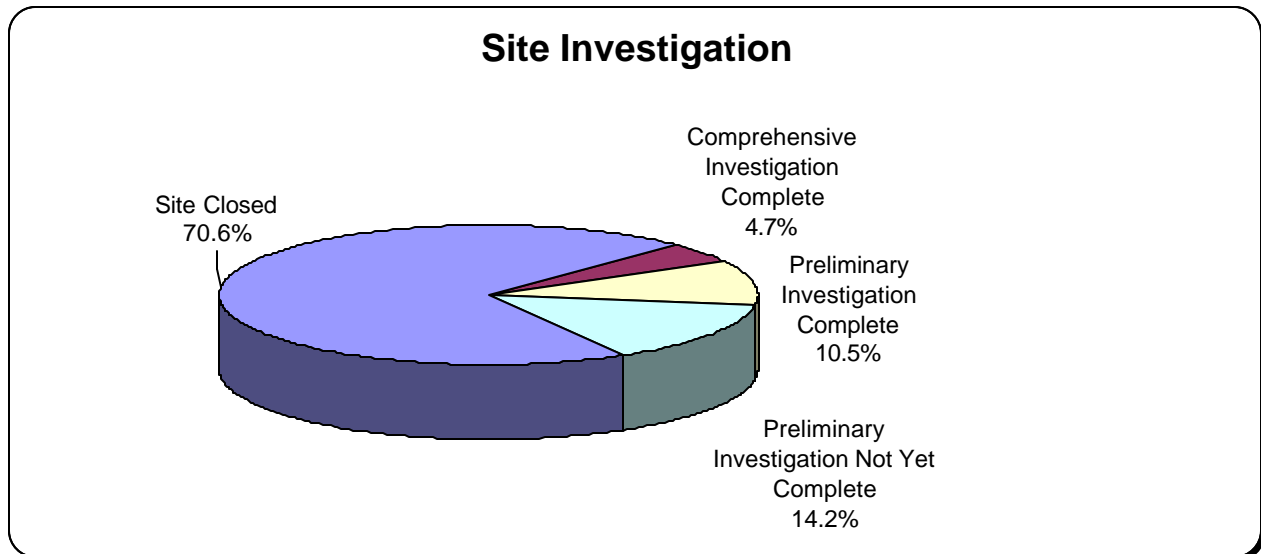
H: Cleanup Activities Conducted



- 70.6% of the sites known on or after 10/1/1993 have been closed.
 - A site is deemed closed when it is demonstrated that the site is permanently cleaned up, that no cleanup is necessary, or that a temporary solution is in place to address any substantial hazards to human health, safety, welfare, or the environment. Sites with temporary solutions must be re-evaluated every five years to determine whether additional cleanup is necessary and feasible.
 - The vast majority of these closed sites will never require any additional cleanup. A small number, while presenting no substantial hazard to human health, welfare, or the environment, will have additional cleanup in the future.
- An additional 15.3% of sites have had some cleanup activity reported.
 - For time-critical releases, Massachusetts cleanup regulations require immediate response actions (IRAs) within the first year. This is an important part of DEP's commitment to reducing the risk from hazardous waste sites. In the vast majority of cases, IRAs include cleanup activity. A small number consist solely of assessment.
 - For non-time critical releases, early cleanup activity is encouraged but not required. Because of the incentives provided in the regulations, more than 4,500 voluntary early cleanup actions have been conducted since 1993.
 - All sites are required to complete cleanup within six years of reporting the release. As noted above, any site with an imminent hazard or time-critical condition must begin cleanup immediately upon discovery of such a condition.
- As a result of these mandatory and voluntary early cleanup actions, only 14.1% of sites have had no cleanup activity reported to date. Many of these sites have had significant assessment work conducted in preparation for cleanup.

PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

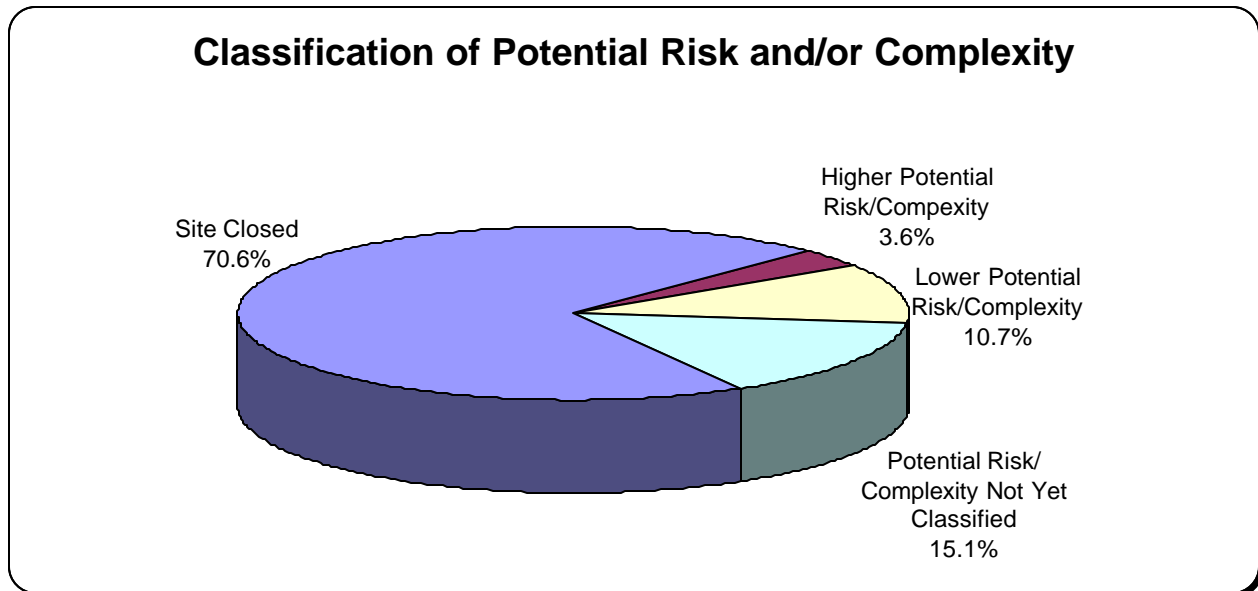
I: Site Investigation



- More than half of the sites that remain open have been investigated to evaluate actual or potential risk and/or site complexity.
- Sites must have a preliminary investigation conducted within one year of being reported to DEP, if the site is not closed within that time period. The purpose of this investigation is to evaluate potential risk and/or site complexity.
- 10.5% of sites have had the preliminary assessment but have not yet been closed and have not yet completed the next phase of investigation.
- Sites must have a comprehensive investigation conducted within two years of completing the preliminary investigation, if the site is not closed within that time period. The purpose of the comprehensive investigation is to more thoroughly evaluate risk and determine the level of cleanup required to eliminate any significant risk.
- 4.7% of sites have had the comprehensive assessment but have not yet been closed.
- 14.2% of sites have not yet had a preliminary investigation and have not yet been closed. These sites include:
 - Sites that are in violation of the requirement to conduct a preliminary investigation within a year of reporting the release to DEP;
 - Sites that were reported after 6/30/2000 (preliminary investigation not yet due);
 - Sites that are exempt from the requirement to conduct a preliminary investigation (such as sites that are proven to have been contaminated by releases at other properties).

PART 1: BASIC MEASURES OF PROGRAM PERFORMANCE

J: Classification of Potential Risk and/or Complexity



- Sites that may pose a higher potential risk and/or complexity compared to other sites are classified as “Tier 1.” The remaining sites are classified as “Tier 2.”
- Currently, 3.6% of all sites (12.5% of open sites) are classified as Tier 1 sites.
 - Approximately 1% of sites are classified as Tier 1A. These are the most complex sites, and the investigation and cleanup of the sites is closely overseen by DEP.
- 10.7% of all sites (36.5% of open sites) are classified as Tier 2 sites.
- 15.1% of all sites (51% of open sites) are not yet classified. These sites include:
 - Sites at which a preliminary investigation has not yet been completed (see previous page); and
 - Sites at which DEP is currently reviewing the proposed tier classification.

PART 2:

PROGRAM HIGHLIGHTS

Massachusetts is widely regarded as a national leader when it comes to waste site cleanup. In 1995, Massachusetts was awarded the prestigious “Innovations Award” by the Council of State Governments. The Innovations Award program recognizes the best and most creative practices in state government that have the potential to be adopted by other states.

This section highlights some of the most successful, innovative, and important elements of the waste site cleanup program, including:

- A. Emergency Response
- B. Protecting Drinking Water Supplies
- C. Answering the question: How clean is clean enough?
- D. Brownfields – Cleaning up and Re-using Difficult Sites
- E. Audits
- F. Enforcement

Except where otherwise noted in Appendix E, all data for this section are from October 1, 1993 through June 30, 2001.

PART 2: PROGRAM HIGHLIGHTS

A. PROTECTING THE PUBLIC FROM EMERGENCIES



Photo: DEP responds to a tanker truck rollover accident in Foxborough. DEP crews are trained to address the environmental contamination issues associated with emergencies like this one.

- Each year, thousands of time-critical releases occur in Massachusetts. These releases include tanker truck rollovers like the one shown above, chemical fires, discoveries of contamination near public water supplies, and more common situations such as leaking underground fuel storage tanks.
- DEP staff and contractors are on call 24-hours to respond to emergencies, and take action at hundreds of these sites each year to protect the public and contain contamination before it spreads. DEP coordinates with other agencies such as the EPA, the Coast Guard, and the state Department of Public Health when necessary.
- An example of the important role DEP often plays in emergency situations: On June 8, 2000, the oil tanker Posavina was punctured accidentally and spilled more than 50,000 gallons of Number 6 fuel oil into Chelsea Creek. Nearly 100 spill responders from DEP, the Coast Guard, NOAA, local cities and towns, environmental groups, and the responsible parties worked together to recover 90 percent of the spilled oil – an extraordinary rate of recovery.
- In most time-critical situations, DEP does not perform response actions directly. Rather, DEP provides guidance to the property owner or other potentially responsible party who is conducting the site investigation and cleanup. Such investigation and cleanup activities are performed under direct supervision of LSPs.
- DEP has been effective in obtaining federal help in addressing time-critical contamination issues in Massachusetts. Between October 1993 and June 2001, more than 120 emergency and time-critical removal actions were performed in Massachusetts by the U.S. Environmental Protection Agency.

PART 2: PROGRAM HIGHLIGHTS

B. PROTECTING DRINKING WATER SUPPLIES

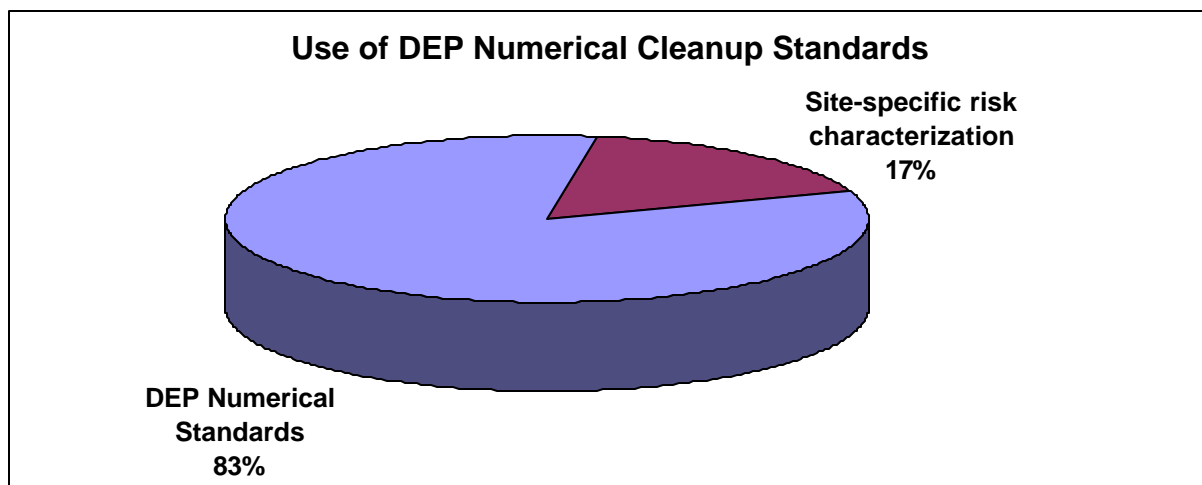


Photo: Quabbin Reservoir.

- DEP is continuously searching for waste sites that threaten to pollute public drinking water supplies. Protection of water supplies is the top priority of DEP's site discovery program.
- Sites that impact public water supply groundwater recharge areas are automatically designated as "Tier 1" sites.
- DEP regulations require that sites impacting groundwater near public or private water supplies be cleaned up according to the most stringent cleanup standards.
- DEP, through investigation, enforcement and cleanup, has addressed numerous threats to public water supplies. Examples include:
 - In the summer of 2001, DEP installed a Permeable Reactive Barrier to intercept a plume of industrial solvent contamination that was migrating in groundwater toward two municipal water supply wells in Wellesley. This project cost close to \$3 million to implement and took two years to plan, design, and construct. Preliminary results show an 80% reduction in contaminant concentrations.
 - In North Reading, DEP-funded cleanup actions were taken in the mid- to late-1990s to control the migration of industrial contamination to the Town of Reading's water supply wells on the Ipswich River. Cleanup actions included groundwater extraction and a soil vapor extraction system. Contaminant concentrations in the municipal well quickly dropped after these systems were installed, and have stayed low ever since.

PART 2: PROGRAM HIGHLIGHTS

C. ANSWERING THE QUESTION: HOW CLEAN IS CLEAN ENOUGH?



- In both federal and state cleanup programs, the question "*How clean is clean enough?*" has been a difficult issue. When waste site cleanup programs were first initiated in the 1970s, the answer to that question was typically based on detailed site-specific risk assessments that offered many opportunities for regulators and the regulated community to disagree on the basis of science, policy, and law. Ironically, few of the "site-specific" assessments were actually based on site-specific exposures -- most often, the remediation was based on a hypothetical future residential exposure, regardless of "site-specific" considerations.
- Massachusetts was one of the first states to offer a workable alternative that provided predictable outcomes and the ability to consider foreseeable site uses. The 1993 regulations included cleanup standards for over a hundred common contaminants, and standards for three types of land use and three categories of groundwater use -- providing the ability to factor in site-specific use information. This predictable, yet flexible, approach has gained wide-spread approval in the regulated community: approximately 83% of site closures are conducted using the numerical standards.
- The promulgated cleanup standards also enhance environmental protection. The standards are set to ensure that contamination at a site is reduced to levels protective of human health, safety, public welfare, and the environment. Providing workable standards ensures that site remediation actually occurs, dramatically reducing the backlog of unremediated and potentially harmful sites.
- The regulations also provide flexibility for those sites that would still benefit from a site-specific approach. A process is provided either to modify the published standards or to assess the site using site-specific information. Detailed guidance on conducting such assessments is available from DEP and other sources. Approximately 17% of risk assessments are conducted using a site-specific approach.
- The numerical standards are updated periodically based on new toxicological and methodological information. The next revisions will take place in Fiscal Year 2003.

PART 2: PROGRAM HIGHLIGHTS

D. BROWNFIELDS – CLEANING UP AND RE-USING DIFFICULT SITES

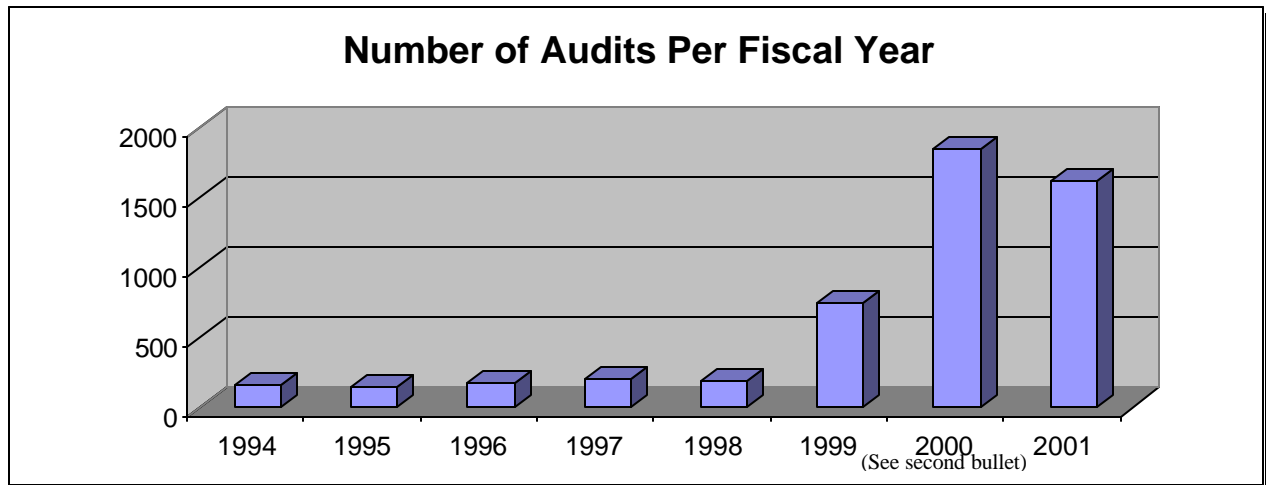


Photo: Anderson Regional Transportation Center in Woburn. This new facility was built on a formerly abandoned portion of the Industri-plex Superfund Site.

- One of the goals of the waste site cleanup is to promote the cleanup and re-use of sites that are abandoned or under-used.
- Revitalization of these sites, often referred to as “brownfields,” benefits communities by cleaning up contaminated property, boosts local economies by increasing tax revenues, and helps preserve open space by allowing re-use of existing infrastructure as an alternative to new development.
- The 1998 Brownfields Act created new incentives for the cleanup and redevelopment of these sites, including more than \$45 million in financial incentives in addition to targeted liability relief. For example, “innocent parties” now receive an end to future liability once they achieve cleanup of a site, and lenders are protected from most liability in the event they obtain a property through foreclosure, as long as they work with DEP to ensure that any imminent hazards are addressed. These incentives attract potential buyers who can fund the cleanup necessary to make the sites safe for use. This influx of resources results in progress at sites that were previously not being cleaned up.
- DEP provides technical assistance to help cities and towns, property owners, and potential developers take advantage of the brownfields incentives. Many sites have made progress. For example:
 - The City of Worcester and the Central Massachusetts Economic Redevelopment Authority recently completed the cleanup and redevelopment of a lead-contaminated foundry site into a 125-room hotel facility, creating 50 jobs and tax revenues estimated at \$50,000 a year.
 - The City of Lawrence renovated a 90-year-old, seven-story stone mill building into 575,000 square feet of office space. The cleanup and redevelopment of this site is part of an ongoing effort to revitalize underutilized mill buildings along the Merrimack River.

PART 2: PROGRAM HIGHLIGHTS

E. AUDITS



- Since October 1993, DEP has audited approximately 5,000 site closures to ensure that site investigations and cleanups are protective and in compliance with requirements.
- In 1998, as part of the Brownfields Act, DEP received significant funding from the legislature to support the audit program and other BWSC initiatives. That same year, BWSC instituted several streamlined audit tools. The combination of streamlining and increased funding has dramatically increased the number of audits conducted each year.
- Since the changes described above were implemented in 1998, DEP has been able to review the majority of new site closure documents.
- DEP has increased its presence in the field, to provide a credible deterrent to non-compliance. Since 1993, DEP auditors have inspected approximately 2,000 sites.
- In 1998, DEP embarked on a project to audit all sites that have had property use restrictions imposed as part of the site closures. Of nearly 1,200 sites with such restrictions, DEP has comprehensively audited approximately 300 sites, inspected roughly 475 sites, and screened over 1,500 property restriction documents.

PART 2: PROGRAM HIGHLIGHTS

F. ENFORCEMENT

- Many parties comply voluntarily to complete timely cleanups. However, a number of parties do not make adequate progress toward a permanent solution. DEP's challenge is to ensure all sites are addressed adequately and in a timely manner. Significant DEP resources are being dedicated to compel those parties responsible for the remediation of sites to comply with the law, regulations, and schedules.
- DEP uses many enforcement tools, from compliance and technical assistance to penalties and orders. In some instances, DEP performs the cleanup using public funds at the worst sites where responsible parties refuse to comply or when they are not able to perform response actions due to financial hardship. DEP then attempts to recover these costs whenever possible, and is authorized by law to recover up to three times the money it spent on the cleanup.
- DEP has instituted an aggressive enforcement strategy to deal with parties who fail to meet site investigation and cleanup deadlines. Throughout the 1990s, the number of sites at which preliminary site investigations were overdue increased by several hundred per year, reaching a total of approximately 1,500 sites in 1999. Through the issuance of hundreds of enforcement documents and significant monetary penalties, DEP has stopped that number from increasing over the past two years, and is working to bring the existing violators into compliance over the next few years.
- Since 1993, DEP has issued 39 complaints to the LSP licensing board in response to cleanup documentation that, in DEP's view, fell well short of the cleanup requirements set forth in law and regulations. The majority of these complaints resulted in formal discipline by the board, including license revocation or suspension in several cases.
- DEP spends public funds to conduct cleanups when private parties are unable or unwilling to do so. DEP then recovers its costs, sometimes imposing liens on property to secure debt and/or pursuing responsible parties in court. DEP works closely with the Attorney General's office to pursue or settle these cases.

CONCLUSION

DEP is dedicated to ensuring that the waste site cleanup program continues to function effectively. DEP is committed to continuous improvement, and welcomes the continued input and involvement of our public constituency.

FOR MORE INFORMATION

To report a spill or site: 24/7: 888-304-1133 (toll free) or 617-556-1133

Visit the waste site cleanup Web site: <http://www.state.ma.us/dep/bwsc>. Among the resources available is a searchable sites database that contains basic information on all the sites DEP knows about. You can obtain information about all the known sites in your town, or obtain detailed information on any one of them.

Call the DEP InfoLine: 617-338-2255 (from the Boston area or out of state) or 800-462-0444 (from elsewhere in Massachusetts), and select 2. The main telephone number for the Boston office is 617-292-5500.

Contact a regional office:

Western (Springfield): (413) 784-1100
Central (Worcester): (508) 792-7650
Northeast (Wilmington): (978) 661-7600
Southeast (Lakeville): (508) 946-2700

Contact the LSP Board: 617-556-1091 or visit <http://www.state.ma.us/lsp>

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This document is available in Adobe Acrobat PDF format from DEP's web site. The address is www.mass.gov/dep/bwsc/files/mos/mopp.pdf.

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